

CLAIMS

1. A method of calculating a position of a first radio station intended to be connected to a second radio station, said calculating method using measurements of a radio signal, called location signal, sent by one of said radio stations, called emitting radio station, to the other of said radio station, called receiving radio station, and propagated to said receiving radio station along a plurality of radio paths including a shortest radio path, characterized in that said locating signal includes a plurality of identical messages, combined by said receiving radio station in order to obtain a signal of higher energy of which the shortest path is detected, said measurements of the location signal being based on said shortest path.
2. A method of calculating a position of a first radio station as claimed in claim 1, for use in a spread spectrum communication network, characterized in that on transmission end said messages are coded with a specific spreading code, and on the receiving end the method comprises:
- a sampling step of sampling received signals,
 - a first detection step of detecting a first message of a received location signal, said first message being received in a time slot called reception time slot,
 - a first storage step of storing samples received in a time slot surrounding said reception time slot,
 - a second storage step of storing samples received in time slots surrounding the reception time slots of at least part of the repeated messages of said received locating signal,
 - a processing step of calculating a correlation function of said stored samples with a pattern related to said message,
 - a second detection step of detecting a first maximum of said cross-correlation function.
3. A method of calculating of a position of a first radio station as claimed in claim 1, characterized in that it comprises a distance calculation step for calculating a distance between said transmitting and receiving radio stations from a roundtrip transmission

time between said radio stations, where said transmitting radio station sends a first location signal to said receiving radio station, and said receiving radio station determines a time of arrival of said first location signal when propagated via said shortest path, and responds by sending back a second location signal indicative of said time of arrival.

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4. A method as claimed in claim 3, characterized in that said second location signal is indicative of said time of arrival in that the chips of its identical messages are rotated with a value indicating said time of arrival.

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5. A method as claimed in claim 3, characterized in that said second location signal is indicative of said time of arrival in which it is sent in a frame at a relative time indicating said time of arrival.

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6. A communication network comprising a first radio station intended to communicate with a second radio station which may move with respect to said first radio station, at least one of said radio stations comprising sending means to send a radio signal called location signal propagated to the other one of said radio stations via a plurality of radio paths including a shortest path, and the other one of said radio stations comprising measuring means for making measurements of said location signal and calculating means for calculating a position of said second radio station from said measurements, characterized in that said location signal includes a plurality of identical messages, combined by the other one of said radio stations in order to obtain a signal of higher energy of which the shortest path is detected, said measurements of the location signal being based on said shortest path.

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7. A spread-spectrum communication network as claimed in claim 5, characterized in that said transmitting station has encoding means for encoding said messages with a specific spreading code, and said receiving station has:

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- sampling means for sampling received signals,
- first detection means for detecting a first message of a received location signal, said first message being received in a time slot called reception time slot,
- first storage means for storing samples received in a time slot surrounding said reception time slot,
- second storage means for storing samples received in time slots surrounding

the reception time slots of at least part of the repeated messages of said received location signal,

- processing means for calculating a correlation function of said stored samples with a pattern related to said message,
- 5 - second detection means for detecting a first maximum of said cross-correlation function.

8. A communication network as claimed in claim 5, characterized in that said transmitting radio station comprises distance calculation means for calculating a distance
10 between said transmitting and receiving radio stations from a roundtrip transmission time between said radio stations, where said emitting radio station has sending means for sending a first location signal to said receiving radio station, and said receiving radio station has determining means for determining a time of arrival of said first location signal when propagated via said shortest path, and responding means for sending back a second location
15 signal indicative of said time of arrival.

9. A radio station comprising sending means for sending a radio signal called location signal which may be propagated via a plurality of radio paths including a shortest path, measurements of said location message being used for calculating a position of said
20 radio station,
characterized in that said locating signal includes a plurality of identical messages, intended to be combined for obtaining a signal of higher energy from which the shortest path is detectable.

25 10. A radio station intended to receive location signals including a plurality of identical messages via a plurality of radio paths including a shortest path, characterized in that it comprises:

- sampling means for sampling received signals,
- first detection means for detecting a first message of a received location signal, said first message being received in a time slot called reception time slot,
- first storage means for storing samples received in a time slot surrounding said reception time slot,
- second storage means for storing samples received in time slots surrounding the reception time slots of at least part of the repeated messages of said received location signal,
- processing means for calculating a correlation function of said stored samples with a pattern related to said message,
- second detection means for detecting a first maximum of said cross-correlation function, said first maximum being used for distance calculation.